To What Extent Can the Hospitality Sector Contribute to Sustainable Tourism Through the Lens of a Circular Economy? The Case Study of Thailand.

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Abstract

While tourism has emerged as a significant contributor to economic growth, job creation, and cultural exchange, tourism in great amounts (mass tourism) poses environmental and social threats to its destinations. The magnitude of this industry involves different sectors such as transportation, food & beverages or hospitality. The paper focuses on the hospitality sector, exploring how this can support more sustainable tourism practices through the lens of a circular economy. The objective of the research is therefore to present insights on how a circular economy can contribute to enhancing sustainable tourism through a circular hospitality sector. The country Thailand has been chosen as a case study due to its mainstream tourism destination with a rich hospitality offer. As such, three hotels have been selected on the basis of a sustainability certification named Green Pearls for the use of the research. The qualitative methodological approach consists of 2 steps. First, the development of indicators of a CE based on the literature review. Secondly, through a content analysis, navigating through the websites of the hotels and of the certification seeking for the established indicators. The findings demonstrate that these hotels are involved with circular practices, which in turn contribute to sustainable tourism.

Key words: sustainable tourism, circular economy, hospitality, Thailand

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Problem Statement

Tourism creates opportunities to strengthen local economies, create jobs, aid in conserving natural environments as well as cultural and traditional assets, and contribute to local infrastructure development (Beladi et al., 2009; BMZ, n.d.; Khan et al., 2020). However tourists in excessive amounts often result in mass tourism which often account for detrimental effects to the environment and host communities (Pigram & Wahab, 1997; BBC, n.d.). In terms of the environment, the tourism sector has contributed to climate change (Azam et al., 2018), by emitting 8% of global carbon emissions both directly and indirectly (Demeter et al., 2021). Although the carbon impact of tourism can be challenging to precisely identify at times, particularly due to the difficulty of calculating indirect emissions, the existence of its emissions is recognizable by observing factors such as accommodation, food & beverage (F&B), recreational services and especially transportation (Demeter et al., 2021). In fact, tourist mobility is the driving factor negatively contributing to climate change; ranging from traveling to and within the desired destination (Azam et al., 2018), which is also displayed in Figure 1. Figure 1 illustrates the carbon footprint of global tourism, split into different categories which contribute to tourism's total carbon footprint (Sustainable Travel International, 2020).
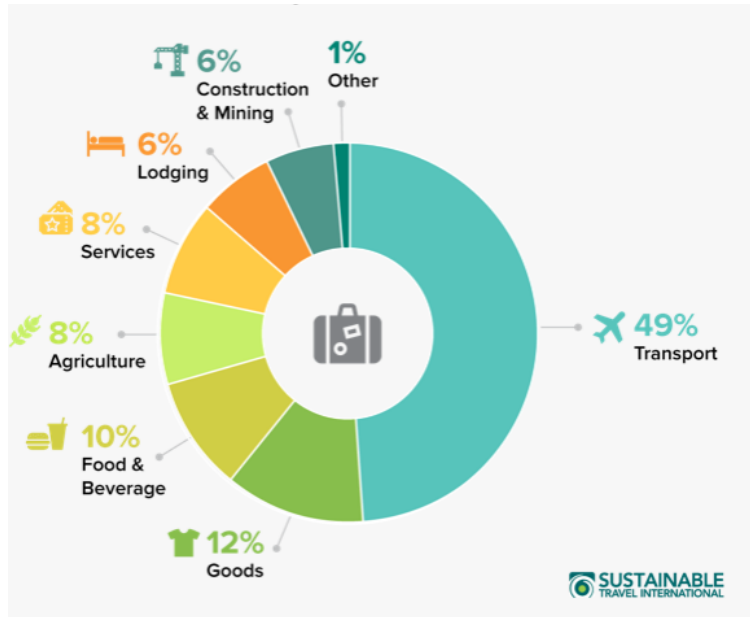
Figure 1, Carbon Footprint of Global Tourism (Sustainable Travel International, 2020)

In addition to the carbon impact, tourism poses other considerable negative effects including

threats to the loss of biodiversity, plastic pollution, extensive amounts of food waste, pollution of

water and generation of water waste (Demeter et al., 2021). Waste is especially to be considered

as the tourism, and particularly the hospitality sector, is a resource based industry. This implies

the requirement of great amounts of resources not only to build and maintain the industry, but

also to sustain the stay of visitors (Mckercher, 1993). Such necessity can result in excess waste,

which is most salient during the visitor's stay in the form of food and plastic waste (especially

single-use plastics) (Sustainable Travel International, 2020). The hospitality sector of the tourism

industry mainly includes accommodation and F&B (Kandampully et al., 2001), which is where

the waste primarily derives from (Mckercher, 1993). Differentiating between the hospitality

sector and tourism is of great importance as while they are deeply intertwined, they are also two

different areas of research (Kunwar, 2017). Tourism mainly refers to the industries, processes

and activities in relation to the movement of people visiting destinations for business, leisure or recreational purposes, and embeds aspects such as accommodation, attractions, and transportation (Kunwar, 2017). Hospitality on the other hand principally consists of the provision of services to the guests, and ensuring their satisfaction during their stay, which is present in the form of F&B, event planning and accommodation (Kunwar, 2017). Tourism therefore includes the hospitality sector as visitors require accommodation during their stay (Kunwar, 2017).

The context

Thailand, as one of the most visited locations in the world, is prone to face both benefits and challenges within its tourism industry (Azam et al., 2018; Soh et al., 2021). The tourism industry in Thailand is a significant catalyst for socio-economic development (Azam et al., 2018). For instance, in 2015, it accounted for 20.8% of the country's GDP, in addition to indirect and direct employment which contributed to 15.4% of total employment (Azam et al., 2018). The figure below presents the international tourist arrivals in 2020 in the world (on the left) and zoomed in on Asia (on the right) (Our World in Data, 2023).
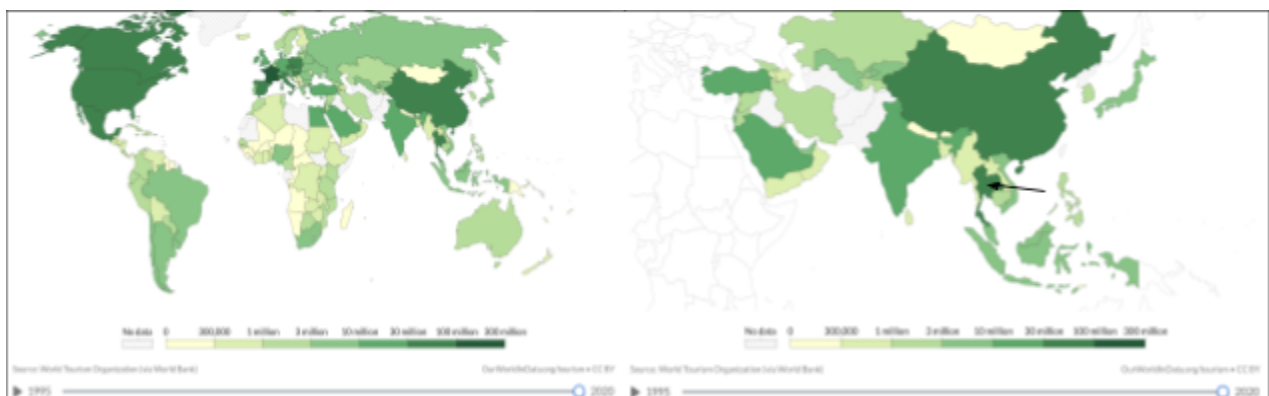

Figure 2, International tourist arrivals, 2020 (Our World in Data, 2023), full planetary view and zoomed in view on Asia with arrow pointing to Thailand

It is notable to identify in Figure 2 that Thailand is in fact a highly visited destination with up to roughly 39.92 million visitors in 2019 (Our World in Data, 2023). As previously mentioned, tourism can account for positive effects such as economic growth, which includes Thailand (Azam et al., 2018). Nevertheless, the industry remains responsible for negative impacts to the environment and host communities (Mmavele & Boonchai, 2020). In fact, the tourism industry in Thailand is one of the largest contributors of solid waste (Mmavele & Boonchai, 2020). For instance, tourist hotspots can experience up to 16.8 kton/year of mismanaged plastic waste (World Bank, 2022). Additionally, the negative impacts of tourism progress beyond the environment, and transcend in social dimensions, involving local communities, in which their culture and heritage endure a lack of protection (Azam et al., 2018). Moreover, tourism in great amounts, can result in resources to be overexploited and the local communities to not benefit from the costs (Beladi et al., 2009).

Given the negative impacts the tourism industry and mass tourism poses, especially in the case of Thailand, recognizing alternative options which may foster more sustainable practices to maintain the beneficial aspects of tourism would be not only favourable, but mostly necessary (Butler, 1999). Thus, the concept of sustainable tourism is relevant.

Research Approach

Sustainable tourism shares diverse insights in its meaning (Butler, 1999). In this research paper the definition referred to is from the United Nation (UN) Environment Program and UN World Tourism Organization (WTO) which states that sustainable tourism "takes full account of its current and future economic, social and environmental impacts, addressing the needs of

visitors, the industry, the environment and host communities" (Global Sustainable Tourism

Council, 2021; United Nations Environment Programme, & World Trade Organization (WTO),

2005: 24). Sustainable tourism therefore allows the minimization of the negative impacts it can

impose, and the maximization of its positive impacts in respect to the involved stakeholders,

especially the host communities (United Nations Environment Programme, & World Trade

Organization (WTO), 2005). Being able to practice sustainable tourism requires careful attention,

planning with clear objectives and sensible awareness of the stakeholders (Mckercher, 2003).

Therefore, notions may arise questioning how exactly the practice of sustainable tourism can be

achieved. Or how its environmental and social impacts are minimized. Considering these

matters, viewing sustainable tourism through the lens of a circular economy (CE) may be of

great value.

A CE is often understood as a phenomenon for greening industries (Ari & Yikmaz,

2019). Tourism can be interpreted as an industry in need of greening (Furqan et al., 2010), and

social justice (Rastegar, 2010). A CE can therefore offer numerous opportunities for the goal of

sustainable tourism practices by assisting as a crucial tool, which can further aid in mitigating the

battle against negative impacts tourism accounts for (Waterstaat, 2019). The definition of a CE

will further be elaborated on in the literature review.

<u>Outline of Research</u>

The following paper is thus an exploratory research which questions *to what extent the*

hospitality sector can contribute to sustainable tourism through the lens of a CE, using Thailand

as a case study. As the research question suggests, the focus will remain on how the hospitality

sector can assist in diminishing negative effects of tourism. When discussing tourism, numerous

sectors can be examined (Sustainable Travel International, 2020), however the scope of this research paper will remain on hospitality in Thailand. Viewing this sector through the lens of a CE, can provide the necessary perspective to acquire how sustainable tourism can be supported. Additionally due to the high touristic activity in Thailand, its current practices towards sustainable tourism is valuable to interpret and can create an insightful outlook as a case study. Hence, the aim of the paper is to explore the potential contribution the hospitality sector has on sustainable tourism within the framework of a CE, utilizing Thailand as a case study. The preliminary themes for the literature review will therefore include sustainable tourism and a CE. The paper will further research these topics through a quantitative methodological approach, from data collected of hotels in Thailand. Consecutively, the research paper will discuss the findings and include a conclusion.

Literature Review

In the following section, significant concepts, 1) Sustainable Tourism; 2) The Circular Economy; 3) Sustainable Tourism and Circular Economy and 4) Sustainability Certification - Green Pearls Certification, will be discussed through a literature review. Firstly, a further elaboration on sustainable tourism will be included, identifying its key meaning and what it entails. Following, a CE will be defined in greater detail, considering its components and how it can be measured, as well as utilized. Additionally, a CE will be discussed in the context of tourism and more specifically hospitality, articulating their relations. Finally, existing initiatives such as sustainability certificates will be considered. This section expresses the role of certification in hospitality and addresses a current one in Thailand named Green Pearls Certification.

1. Sustainable Tourism

Sustainable tourism has previously been mentioned as a concept that "takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (Global Sustainable Tourism Council, 2021; United Nations Environment Programme, & World Trade Organization (WTO), 2005: 24). It is worth noting that the term is one that has faced numerous conversations and debates regarding its meaning, allowing room for the term to be interpreted differently by individuals (Butler, 1999; Lu & Nepal, 2002; Sharpley, 2020). For instance, older literature characterized sustainable tourism to be "...developed and maintained in an area (community, environment) in such a manner and at such a scale that it remains viable over an infinite period and does not degrade or alter the environment (human and physical) in which it exists to such a degree that it prohibits the successful development and well being of other activities and

processes*"* (Butler, 1993: 29). This definition solely places emphasis on the future of tourism, which proposes a single sectoral approach rather than a holistic and multi-sectoral one which naturally lies in the concept of sustainability and sustainable development (Butler, 1999; Sharpley, 2020). It is therefore also of great value to define the form of tourism which is in question when aiming to make such a large industry more sustainable and for the desired change to be both feasible and realistic (Butler, 1999). Forms include conventional tourism as well as alternative tourism (such as "green" or "eco" tourism) (Butler, 1999). The forms of tourism can be further understood by considering factors including an ecological viewpoint highlighting the necessity for ecologically sustainable tourism; a sectoral viewpoint such as the economic sustainability of tourism; a viewpoint accepting tourism as part of a strategy for sustainable development throughout the physical and human environments; and a viewpoint of the long-term viability of tourism, acknowledging the competitiveness of destinations (Butler, 1999). While this research paper remains focused on the United Nation (UN) Environment Program and UN WTO definition, conceding to existing definitions is valuable in perceiving the ambiguity of the term.

1.1 Significance of Sustainable Tourism

Tourism in general terms can foster economic benefits, generate foreign exchange and introduce individuals to diverse cultures or preserve traditions (Hardy et al., 2002). It highlights forces for social and economical change, growing environmental awareness, cultural sensitivity, and the conservation of destinations' environmental and cultural resources (Liu, 2003). Being able to maintain it, along with its long term viability and wellbeing of the destination, in addition to minimizing the negative impacts tourism can impose, is of great interest (Lu & Nepal, 2009).

With the existence of mass tourism and its negative effects or disruption on the host community, seasonal jobs and the environment, it is a prone candidate for initial reform (Clarke, 1997; Hardy et a.l, 2002). Hence seeking for an alternative to mitigate these impacts is a crucial point of discussion, and calls for a form of tourism which is more green and can be operationalised (Hardy et al., 2002; Lu & Nepal, 2009), while positively contributing to the local community and economy (León-Gómez et al., 2021; Michniewicz-Ankierztajn et al., 2018). Such a reform creates an additional opportunity to contribute to sustainable development, which is significant when considering sustainable tourism, as it includes the aim of "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Secretary-General & Development, 1987: 54). Since both sustainable tourism and development strive for sustainability, which is defined as the balanced or wise use of resources, it enhances steady life conditions for present and future generations (Lu & Nepal, 2009; Liu, 2003). The key point regarding sustainability and sustainable development in the context of sustainable tourism is not to ensure the continued integration of environmentally, small-scale and culturally appropriate forms of tourism, but rather aiming to shift mass tourism developments to more sustainable practices (Butler, 1999). This shift in perspective also allows sustainable tourism to be viewed as a goal to be achieved and applicable to all forms and scales of tourism rather than a type of tourism product (Lu & Nepal, 2009). Sustainable tourism is thus argued to be attainable at local, regional, national and international scales (Lu & Nepal, 2009).

1.2 Stakeholders and Sustainable Tourism Indicators

Thus far, a basic understanding of sustainable tourism has been established. Further considering the implications of the social context of sustainable tourism in relevance to the

involved stakeholders is of great importance to identify, especially if the needs of involved

individuals sought to be met (Hardy et al., 2002 & Rasoolimanesh et al., 2020). The stakeholders

typically involve the tourists, the government, non-governmental organizations, businesses, and

the residents (local or host community) (Rasoolimanesh et al., 2020). The identification of

stakeholders involved supports being able to recognize who to consider in decision making,

taking into account how each would be affected and benefit most from sustainable tourism

(Rasoolimanesh et al., 2020). With such, the use of indicators to recognize sustainable tourism is

more effective to provide the platform for stakeholders such as the host community with

information to identify, assess, and take prompt action in response to crucial changes being

brought about by tourism to the destination's natural environment, communities, and other

resources (Rasoolimanesh et al., 2020). Indicators in relation to sustainability are not always

quantifiable and are often subjective, however common objective indicators include energy

efficiency, employment rates, biodiversity conservation, crime rates, and usage as well as

availability of clean potable water (Rasoolimanesh et al., 2020). Finally, considering the

stakeholders and indicators is most important to enhance positive contributions to the destination

and to the local community (Michniewicz-Ankierztajn et al., 2018).

1.3 Gaps in research

It is also relevant to mention limitations and critique points on the concept of sustainable

tourism due to the magnitude and vagueness of the concept (Lu & Nepal, 2009; Sharpley, 2020).

For instance, there is a lack of specificity regarding what the human and environmental needs

embed, in addition to a time period to determine whether those needs have been met (Lu &

Nepal, 2009). Some organizations such as the WTO prefer to maintain a broader definition of the

concept as they believe it to be a destination-specific concept and should thus be defined on a case-by-case basis (Bianchi & de Man, 2020; Hardy et al., 2002). Furthermore, addressing sustainable tourism with the use of other concepts such as a CE, can provide distinct insights to reconsider the gaps which may exist, amplifying opportunities for sustainable development impacts of tourism (UNWTO, n.d.).

2. <u>The Circular Economy</u>

A CE is yet another concept which entails numerous definitions and can vary in its context (Ari & Yikmaz, 2019). It is however most commonly used as a phenomenon for greening industries (Ari & Yikmaz, 2019), by optimizing resource use, reducing production as well as consumption of greenhouse gas emissions and offering opportunities for revised sustainable business models (Sorin & Einarsson, 2020). A CE is thus, as defined by the UN (2021), "designed in such a way that they [materials] can be reused, remanufactured, recycled or recovered and thus maintained in the economy for as long as possible". It places emphasis on production efficiency, decoupling, resource efficiency, lower resources extraction and slower material flow instead of a linear economic model (Ari & Yikmaz, 2019). The implementation of a CE allows a continuous positive development cycle which enriches and conserves the longevity, value, quality and high utility and long-lasting design of products (Ari & Yikmaz, 2019). In a CE, waste is completely eliminated, and the conventional "take-make-waste" linear economy is converted into business value by retaining resources, products and materials in use for the longest period of time (Rodríguez et al., 2020; Sorin & Einarsson, 2020). In practical terms, this can be achieved by regenerating natural capital with the stop of leakages from waste and pollutants, minimizing the necessity of raw resources, and returning valuable organic nutrients back to soils for new growth (Sorin & Einarsson, 2020). Other examples include

restoring social and human capital by creating meaningful job opportunities through fair and equal distribution of resources (Sorin & Einarsson, 2020). A CE approach provides a crucial toolkit for implementing, monitoring, adjusting, and delivering sustainable production and consumption patterns while simultaneously fostering innovation and competitiveness (Sorin & Einarsson, 2020). In relation to sustainable development, adopting a CE can serve as a boost for achieving a sustainable society, in which prosperous socio-economic systems can be sustained within the carrying capacity of the planet for both present and future generations (Sorin & Einarsson, 2020; Walker et al., 2021). Furthermore, a CE can be measured through a variety of different approaches (Moraga et al., 2019). The measurability and recognition of a CE is crucial in order to identify its progress, and if desired amelioration is necessary (Moraga et al., 2019). The most commonly used ones, which will be discussed in the following sections, include a life cycle assessment, a material flow analysis and an evaluation and monitoring indicators (C-indicators).

2.1 Life Cycle Assessment

The importance of the life cycle assessment (LCA) lies in its ability to account for the social, economic, and environmental impacts a product may inflict during its entire life cycle (Guinée et al., 2011; Hellweg & Mila i Canals, 2014). The LCA fosters opportunities to reduce environmental implications, and attain solutions in order to prevent further damage, which is measured by evaluating a product's life cycle (Guinée et al., 2011; Hellweg & Mila i Canals, 2014). This includes the extraction of raw materials followed by the processing of those materials, manufacturing, distribution, usage, repair, maintenance, recycling or their disposal (Guinée et al., 2011; Hellweg & Mila i Canals, 2014). Figure 3 below illustrates this process.
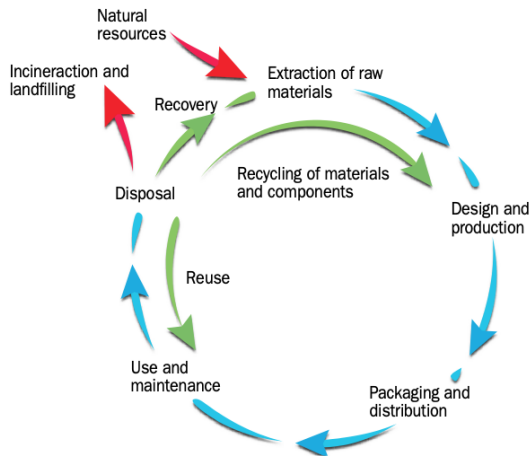
Figure 3, Life Cycle Assessment Iterative Process (Guinée et al., 2011)

Figure 3 presents how a continuous circular loop is attainable with the repurposing of disposed

materials in a circular loop. However, such a circular loop is not always feasible depending on

the system boundaries in place, which include cradle-to-gate, cradle-to-grave, and gate-to-gate

(Guinée et al., 2011). The linear process known as cradle-to-gate runs from the extraction of raw

materials to the factory gate, whereas cradle-to-grave starts with the extraction of raw materials

and ceases with the use and disposal phase. The gate-to-gate system begins at the defined point

along the life cycle and continues to the next (normally the product is already final within this

system) (Guinée et al., 2011). These three system boundaries are essential for a LCA given that

they enable the comprehension of the product's environmental impact by classifying it as either

raw materials, intermediate components, or as a final product (Guinée et al., 2011).

Substantially, a LCA facilitates a holistic evaluation of the environmental impacts of a

product through a comprehensive and systematic approach (Kobayashi et al., 2015). By

identifying hotspots a LCA can assist in targeted improvements in those areas and in decision

making for effective resource allocation to reduce environmental impact (Cowell et al., 2002).

Additionally, it can help in policy and regulation development in setting standards for environmental management and sustainability (Cowell et al., 2002).

2.2 Material Flow Analysis

A material flow analysis (MFA) enables the quantification of the process chain of materials which extends over the extraction, manufacturing, chemical transformation, recycling, consumption and disposal of materials (Moriguchi & Hashimoto, 2016). MFA is furthermore a tool which can analyze transportation, transformation or storage of materials within a defined system (Allesch & Brunner, 2015; Brunner and Rechberger 2004). The use of such a tool can further serve to meet a higher recycling rate as well as diminish losses of potential secondary raw materials (Allesch & Brunner, 2015). Being able to quantify data is useful in describing inputs and outputs of materials, and allows circularity to be not only measurable and comparable but also to be used for policy making (Bringezu & Moriguchi, 2002). MFA can be observed as a general system approach which can disclose various interfaces between flows and stocks; scientific studies and policy applications; upstream resource issues and downstream waste issues; technosphere and ecosphere; valuable materials and toxic substances, theoretical analysis/models and on-site practices; energy (with GHGs) and materials (from non-renewables).

2.3 Evaluation and monitoring indicators (C-indicators)

The evaluation and monitoring indicators are more targeted and intended to enable immediate identification of characteristics that fall under a CE (Saidani et al., 2019). These indicators, commonly referred to as Circularity-indicators (C-indicators), can condense and summarize the complexity of a dynamic environment (Saidani et al., 2019). C-indicators are a

vital tool for capturing the stakes of reuse and recycling at the end of a product's life cycle. It also possesses the capacity to simplify and facilitate optimal use of complex information. These indicators are divided into 10 categories, which are displayed in Figure 4.

Categories (criteria)	#1 - **Levels** (micro, meso, macro)	#2 - **Loops** (maintain, reuse/ reman, recycle)	#3 - **Performance** (intrinsic, impacts)	#4 - **Perspective** (actual, potential)	#5 - **Usages** (e.g. improvement, benchmarking, communication)
	#6 - **Transversality** (generic, sector-specific)	#7 - **Dimension** (single, multiple)	#8 - **Units** (quantitative, qualitative)	#9 - **Format** (e.g. web-based [tool], Excel, formulas)	#10 - **Sources** (academics, companies, agencies)

Figure 4, Categories for the proposed taxonomy of C-indicators (Saidani et al., 2019)

Appendix A, elaborated on what each category entails in further detail. These indicators are useful and important instruments that can help with the promotion of more circular conduct (Saidani et al., 2019). They further offer a grasp of an organization's or an aspect of interest's structures and operations (Saidani et al., 2019). By navigating through the categories step-by-step, areas can be identified in which improvements and advancements toward a CE can be accommodated (Saidani et al., 2019).

Three distinct approaches (LCA, MFA and C-indicators) in reference to measuring a CE have been identified. These are important to consider and comprehend if they are to be utilized in different contexts such as sustainable tourism. To provide further depth, the following section will expand on the role of CE models. More specifically, how these can be depicted and serve as examples of potential implementations of CE.

2.4 Circular Economy models

Forming models foster opportunities to guide enterprises on how to embed CE practices such as recycling or the use of renewable energy (Sorin & Einarsson, 2020). Figure 5 for instance depicts resource flows in an economic system piloted by solar energy, in which material

flows and linear products are replaced by circular cycles; biological and technical cycles (Sorin & Einarsson, 2020).
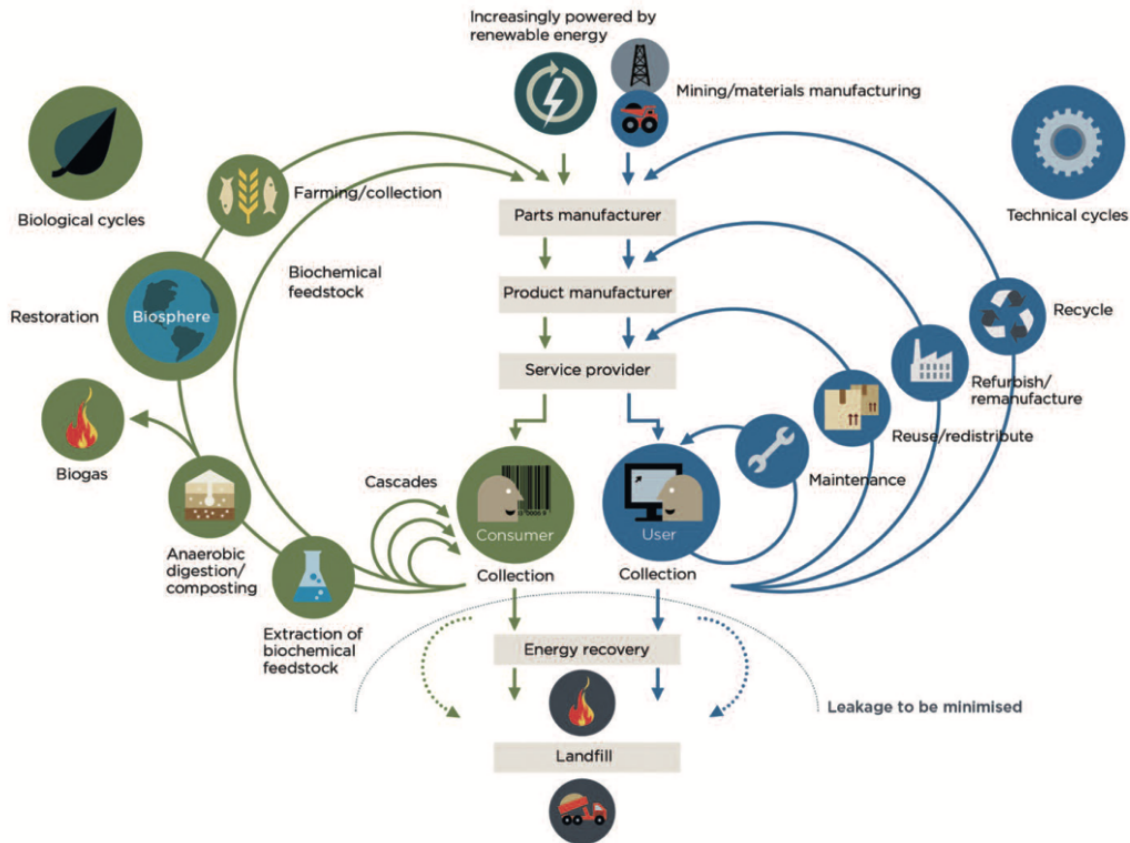

Figure 5, Resource flows in a CE - the Ellen MacArthur Foundation (EMF) Butterfly diagram (Sorin & Einarsson, 2020)

With such a model in practice, the regenerative goal of a CE is in place, while eradicating linear inefficiencies such as the following points expressed by Sorin & Einarsson (2020):

➔ *Unsustainable materials*; that cannot be regenerated / circulated

➔ *Underutilised capacities*; for example products are not fully functional or do not operate at full capacity

➔ *Premature product lives*; meaning products are not used at their full potential for a completed working life, due to lack of maintenance and repair

➔ *Wasted end-of-life value*; valuable products/components/materials or energy not recovered at their end-of-life

➔ *Unexploited customer engagement;* missed opportunities to engage customers throughout product or service lifecycle. For example through selling functionality instead of products

A CE model therefore functions as an instrument to prevent the previously expressed inefficiencies and foster circular practices.

3. Circular Economy and Tourism

In terms of tourism, a CE can reform a more resilient, environmentally, economically sustainable tourism industry (Sorin & Einarsson, 2020). A CE, similar to sustainable tourism, aims to address and place positive emphasis on the value of economic, social and environmental factors; its core pillars (Sorin & Einarsson, 2020). The use of a CE is therefore an optimal approach to gain more sustainable practices in tourism (Sorin & Einarsson, 2020). Specifically with reference to the hospitality sector, a CE can be implemented by prosecuting the following which has been elaborated on by Sorin & Einarsson (2020):

➔ Develop deeper supply chain cooperation aiming for value co-creation within the extended local hospitality network

➔ Identify circular value creation opportunities and deployment pathways through supply chain mapping

➔ Consider servitization of high and mid value asset expenditures, such as bedding, furniture, F&B equipment

➜ Consider the mutualisation of resources, materials and of idle assets (E.g. asset

recirculation, sharing 'intra-organisations' sharing platforms, etc.)

➜ Focus on market positioning and marketing communications through a coherent Circular

Economy hotel storytelling and brand message

➜ Deploy environmental impact and Circular Economy action monitoring tools to measure

resource productivity

➜ Implement Environmental Management Systems to monitor energy consumption,

resource use, emissions, food waste and associated operational cost savings opportunities

➜ Increase cooperation with private sustainability certification organisations or government

regulatory bodies

➜ Use Circular Economy specialist third party expertise to provide staff understanding of

CE opportunities and practices while not diverting existing labour resources

As such, a CE can be understood as a tool to encourage waste management, upstream and

localized supply chain servitization, and boost the involvement of local communities (Sorin &

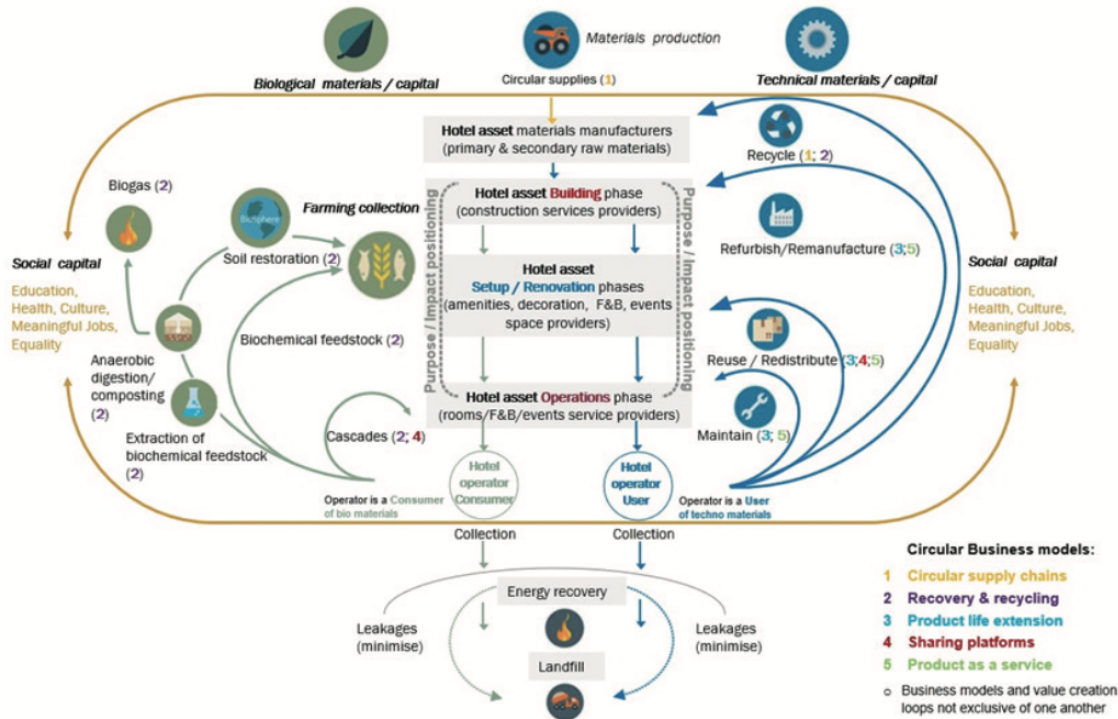Einarsson, 2020). This is further illustrated in Figure 6.

Figure 6, A conceptual CE framework for a circular hotel operator (Sorin & Einarsson, 2020)

Figure 6 presents a conceptual framework for a circular hotel operator, with respect to its circular

value creation loops (Sorin & Einarsson, 2020). This includes the building phase, setup,

operation, renovation and deconstruction along with its potential created value at each phase

(Sorin & Einarsson, 2020). This example provides an appealing illustration of a potential circular

transformation pathway in which technology and biological material are exchanged to reduce

environmental impacts while also supporting the regeneration of social capital (Sorin &

Einarsson, 2020).

The use of a CE in hospitality is especially significant as a response to the higher health,

hygiene and safety standards to shift the high use of single use items (such as plastics or food

packaging) and reinforce a CE approach in e.g. F&B, cleaning and textiles products supply chain

from manufacture to distribution, use and disposal (Sorin & Einarsson, 2020). Overall the

successfulness of a CE in hospitality would require encouragement for green procurement of

waste management, raw materials, and energy saving schemes, while involving local

employment and opportunity jobs for within the destination (Jones & Wynn, 2019;

Padilla-Rivera et al., 2021). In regards to the environmental factors within the tourism and

hospitality sector, managing, monitoring and keeping track of the current matters is critical if

change is to be implemented (Jones & Wynn, 2019). Figure 7 depicts a model of important

points to consider for sustainability management.
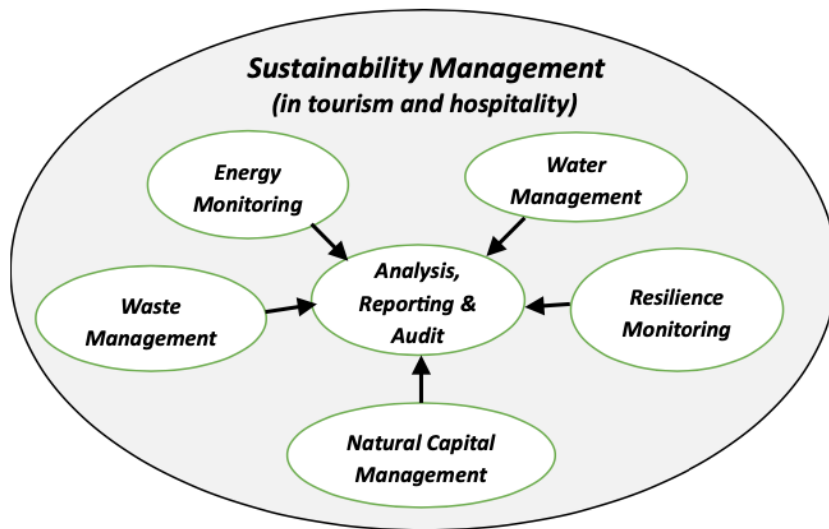
Figure 7, Sustainability management sub-processes in tourism and hospitality (Jones & Wynn,

2019).

By managing these factors through a circular economy, efficiency within the tourism industry

can be enhanced and the sustainable development of tourism can be achieved (Jones & Wynn,

2019). Consequently, the action of monitoring, analyzing, reporting and acting accordingly to the

collected data is key to implementing and sustaining a CE (Jones & Wynn, 2019). Finally

another crucial point for a CE is transparency and traceability (UNECE, n.d.). Being able to

openly share information and trace back to that information, allows for data to be accessed if

changes are necessary in addition to being honest and open about the enterprises practices

(UNECE, n.d). In terms of hospitality, transparency is important in order for customers to make

informed and mindful decisions (Lin et al., 2022).

 4. Sustainability Certification - Green Pearls Certification

A sustainability certification can serve as a stagnant mark of an enterprise's past

achievements and a reflection of the devotion to stakeholders and community it contributes to, in

addition to keeping them accountable for their actions (Long, 2020). The usage of a

sustainability certification is an adaptable tool used continuously during the expansion of an

enterprise. Being environmentally conscious is a perpetual, transforming process, thereby

businesses ought to have access to a robust, adaptable framework that will guide them further

along the way (Long, 2020). Additionally, a certification incentivizes to improve overall

social-welfare, environmental and economic performance (Blackmen & Rivera, 2011). Such

certification in the tourism sector can situate a positive and effective influence especially within

the hospitality sector (Blackmen & Rivera, 2011; Font et al., 2003). Furthermore they allow for

bottom-up initiatives involving local communities, and assure that the tourism industry is

following given standards and practices that fall under sustainable tourism (Font et al., 2003).

Therefore monitoring and measuring their operations is vital to ensure they adhere to the

certification's standards (Blackmen & River, 2011; Long, 2020). This additionally allows for the

destination's practices to be acknowledged and officially recognized providing a form of

credibility (Bowman, 2011). An example of such, is the Green Pearls Certification (GPC).

The Green Pearls is an initiative which supports environmental protection and demonstrates social commitment by unifying international tourism companies (Green Pearl, n.d.). In order to be a member of the Green Pearls, candidates must fulfill at least 80% of the requirements (Green Pearl, n.d.). These requirements fall under numerous categories such as the management plan, architecture, flora and fauna, water consumption, energy consumption, waste management, housekeeping, food, policies, employees, social projects, cultural commitment, and communication (Green Pearl, n.d.). Within these categories are a number of criterias, which can be met all regarding social, environmental and economical factors which can contribute to the sustainable development of tourism (Green Pearl, n.d.). Green Pearls is present worldwide including in Thailand, working with vacation rentals, restaurants and hotels who strive to be green and practice sustainable tourism (Green Pearl, n.d.).

Methodology

In order to explore how the hospitality sector can contribute to sustainable tourism through the lens of a CE in Thailand, this study adopts a qualitative research approach. A qualitative research method facilitates an explorative and interpretative type of study, which provides insights and an opportunity for interpreting different contexts (Hennink et al., 2020). Such an approach is suitable for this research as circularity and sustainable tourism are content rich topics. Moreover, the following section will discuss what the methodological process of the study entails by considering the context of the study, the sample, the data collection and finally the data analysis.
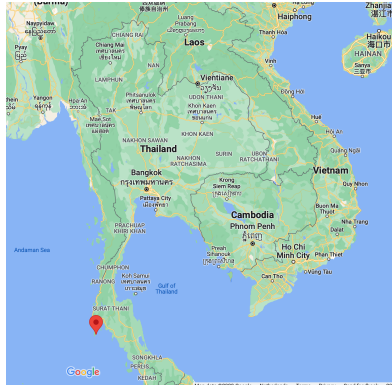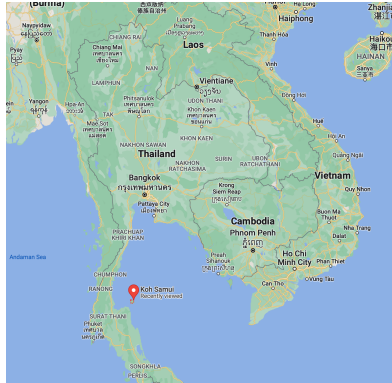
<u>Sample</u>

The sample has been selected based on the GPC, which has been chosen as an instrument for sampling due to its consideration of hotels (which are in the hospitality sector) that are involved with sustainable practices. This serves as an advantage for the research for multiple reasons. Firstly, since the hotels are recognized for their sustainable practices, hence through the certification, the question is what these practices are and whether they are circular. Secondly, the certification provides a sense of credibility, formality and trust in the samples and their data. Finally the certification permits for further data availability, which will be elaborated on in the data collection section.

Within the Green Pearls there are a total of three hotels in Thailand. These are the ones that were selected. The first is located in Phuket and is named Keemala. The second hotel is named The Tongsai Bai and is found in Koh Samui. Lastly, the establishment of Zeavola is located on Phi Phi island. It is important to note that amongst this selection, Zeavola officially

presents themselves as a resort[1], but their scalability also brands them as a small hotel.

Nevertheless when referred to "hotels" all three locations fall under this. Table 1 below provides

an overview of the hotels along with their location on the map and an estimate number of visitors

they have received in the past. The "past" is a relative term, but tourist rates changed drastically

due to COVID-19. The number of visits are still adjusting since the pandemic, and therefore a

general estimated number of visitors is provided to create a sense of the place.

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[1] A resort aims to provide all visitors needs such as food, entertainment and wellness on the one premise, while a hotel's primary goal is to offer lodging (Mill, 2008).

Name of Hotel	Accommodation Description	Location	Estimate number of visitors in the past in location	Link to the websites of the hotel
Keemala	Keemala describes themselves as a luxurious hotel with a holistic experience inspired by local traditions and natural splendor. They strive to respect the environment and cultivate practices with a low impact on the planet. The hotel offers numerous villas such as clay pool cottages, tent pool villas, tree pool houses, and bird's nest pool villas (Keemala, n.d.).		In 2022, Phuket received 9 million visitors (Chuenniran, 2023).	https://www.keemala.com
The Tongsai Bai	Tongsai Bai is part of a greater chain named Garrya, which is located in other locations in Asia. They also work with the Banyan Tree foundation, which aims for sustainability and responsible tourism within traveling destinations. Tongsai Bai's concept is to offer their visitors a simplistic yet luxurious experience at the center of		In 2019, Koh Samui hosted roughly 2 million visitors (Taweewong, 2020).	https://www.garrya.com/en/destinations/samui
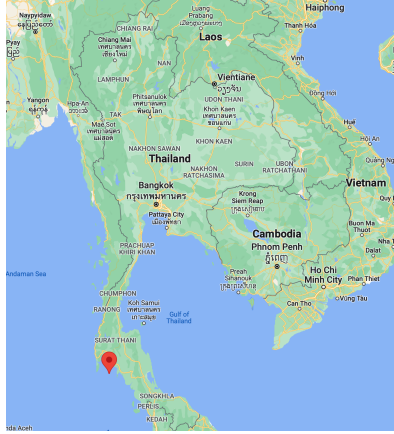
	the environment (which they are conserving) (Garrya Tongsai Bay Samui, n.d.).			
Zeavola	Zeavola is a sustainable luxury resort. Their concept is for visitors to immerse themselves in the simplicity of rural life in teakwood suites, bringing them closer to nature. Additionally they strive to protect their island through a self-sufficient lifestyle, inviting benefits for future generations (Zeavola, n.d.).		In 2018, Phi Phi Island received 1.8 million visitors (Statista, n.d.)	https://www.zeavola.com

Table 1, Overview of hotels and their Destination

Data collection

The data collection consisted of a two step process. Firstly, based on the literature review, a set of indicators were developed to serve as a crucial tool for identifying the characteristics of a CE. Secondly these indicators were used to collect data which derived from the hotels publicly accessible information published on their own websites (these can be accessed in Table 1 under "*Link to the websites of the hotels*"). Among these links, different tabs were navigated through looking for keywords such as "About us" or "About [hotels name]", which shared their practices. To provide further insight, a similar process was applied to the information available on the GPC website. The GPC website is information rich, with multiple links such as "restaurants", "vacation rentals", "green projects", "hotels" and more. The "hotels" section was the source of information, in which all of their worldwide certified hotels are listed. In these, Keemala, the Tongsai Bai and Zeavola were found. Each hotel was clicked on individually, whereupon material on the practices that certified these hotels was acquired. The choice for also exploring the certification's website is to take into account the procedures that qualify the hotels, especially that they have to maintain and abide by these. Finally, the data collected (the practices of the hotels) was divided into 3 categories which are vital to a CE; social, environmental and economical. This created an organized overview, which eased the process of the data analysis.

Data Analysis

The research approach entailed the use of a qualitative research method. Therefore the data analysis was conducted through a content analysis. A content analysis serves as a research tool employed to identify certain themes, words or concepts within qualitative data (Bengtsson, 2016). The use of such a tool can allow researchers to analyze and interpret the presence,

meanings as well as relationships of the concepts of interest, which can be used quantitatively or qualitatively (Bengtsson, 2016). Since the research method is qualitative, consequently the content analysis is also qualitative. A qualitative content analysis presents the data in words or themes, which offers the possibility to draw interpretation of the results (Bengtsson, 2016). It also includes the option to analyze the data through a latent or manifest analysis (Bengtsson, 2016). The manifest analysis was used, as it permits the researcher to describe and stay close to what a text says, and recognize the visible or obvious (Bengtsson, 2016). The use of this research method is valuable, as it allows for the presence of CE indicators to be recognized, to then be interpreted if this to some extent contributes to sustainable tourism. Therefore to be precise, the content of interest in this analysis were traits or indicators of a CE. Based on the literature review, a series of CE indicators were developed, which is exhibited in Table 2, to be utilized as points, "themes" or content for the identification of a CE in the data. These indicators were mainly obtained by systematically examining the literature review bit by bit, and drawing points that are assessable. The literature derived from for instance the C-Indicators (Saidani et al., 2019), authors Sorin & Einarsson (2020), Jones & Wynn (2019), and Padilla-Rivera et al. (2021).

Each indicator has a number. Each point from the collected data received one or more of these numbers based on whether they align with what they depict. Since the data is already divided into social, environmental and economical factors from the data collection, the allocation of these indicators through the analysis allowed room for interpretation on patterns of recurring points or themes. Due to the subjective nature of a content analysis, the analysis was conducted at least 2 times by the researcher. The indicators can be found in the Appendix B.

Results

The following section will present the results of the research. Firstly, the findings are portrayed and presented in Table 3, which entails a summarized version of the full results which are located in Appendix C. The findings of the three hotels will shortly be summarized, by stating some overall observations. Following, the CE indicators will be depicted and addressed more specifically. Finally, the "Discussion" section will include an interpretation of the observations, basing these on the literature review. Finally, conclusions will be drawn in order to answer the research question.

		CE indicators categorized by the three dimension within a CE		
Hotel Name	Source	Social	Environmental	Economical
Keemala	https://www.keemala.com/green/	Use of fabric and textiles produced by ethnic minority group in Thailand (#1.10; #1.20; #1.21)	Villa's include own water treatment system. Treated water quality is released back to environment (#1.2; #1.3). Water is analyzed monthly (#1.15; #1.16) Methane released from waste management system is guided into the ground (#1.2) Through recycling waste is classified and treated efficiently (#1.2) Greywater is reused to water gardens and landscape (#1.2) Provision of glass-bottled water for reduction of plastic waste (#1.2) Use of toiletries made of cloth materials and recycled paper (#1.2) A garden of naturally grown fruit, vegetables, and herbs which are used within Keemala's dining outlets and spa (#1.12) Green Pearls certified (#1.17)	Use of fabric and textiles produced by ethnic minority group in Thailand (#1.10; #1.1 #1.20; #1.21; #1.21)
	https://www.greenpearls.com/hotels/keemala/	Wherever possible, vegetables and fruits are organically grown and sourced from local suppliers and farmers (#1.10)	Use of own bio-organic fertilizer produced from organic waste which is used for gardening (#1.2) Enchanted gardens with naturally and organic grown herbs, vegetables and fruits (#1.12)	Local employment (#1.20)

		Employees receive ongoing training; Knowledge growth for effective waste management (#1.20; #1.18) Locals are employed (#1.20) Employees are encouraged, supported and trained in their development (#1.20). Support and participation in local social projects (#1.21) Showcasing Phuket's tropical woodland splendor alongside preserving Thailand's longstanding traditions and cultures (#1.20) Developing the community, infrastructure, and economic well-being, through local jobs, buying local products, etc. (#1.2; #1.10; #1.20)	Employees receive ongoing training; knowledge growth for effective waste management (#1.20) Wastewater that is treated is reserved for watering plantation (#1.2) Setting water conservation goals for all hotel activities and increasing internal reuse for optimizing water use, e.g., gray water is reused for landscape (#1.2) Rainwater is used for hydroponic plants (#1.2) Waste separation and recycling by providing separate containers for different types of waste (#1.2) Offer of glass-bottled water, paper straws, and packaging for toiletries is made from fabrics and recycled paper (#1.2) Reduced usage of natural materials, to prevent further deforestation and other environmental impacts (#2.3) Developing the community, infrastructure, and economic well-being, through local jobs, buying local products, etc. (#1.2; #1.10; #1.20)	Developing the community, infrastructure, and economic well-being, through local jobs, buying local products, etc. (#1.2; #1.10; #1.20) 100% natural toiletries are sourced locally (#1.10)
The Tongsai Bai	https://www.greenpearls.com/hotels/tongsai-bay/	Locals are employed (#1.20) Energy saving training for locals (#1.18) Garbage Management Awareness at local school (#1.20; #1.18) Sharing knowledge, interacting and supporting local children (#1.20; #1.18) Contribution to the local community, the greater Thailand region and abroad (#1.20) Donations for building school canteen & fire station for local community (#1.20; #1.21)	Wooden floors replaced with concrete structure and stone tiles to avoid constant replacement (#1.2) Implications of garbage management and recycling (#1.2) Part of 'Tourism Authroity of Thailand' – The 7 Green Concepts, The Green Island Foundation – Koh Samui, The Low Carbon School Project (#1.17; #1.21) Continuous planting of trees (#1.2) Use of recycled water for plantations and flushing in toilet at staff dormitory (#1.2) Used water is sent to a septic tank for purification and used for watering plants (#1.2) Leftover food, leaves, and branches are sent to organic garden to be turned into fertilizers (#1.2) Reduction of garbage by using reusable materials (#1.2) Use of bio-degradable plastic bags & straws (#1.2)	Locals are employed (#1.20) Donations for building school canteen & fire station for local community (#1.20; #1.21)
Zeavola	https://www.zeavola.com/greenbook/	Ceramic containers for bathroom appliances derive from a local company based on organic, coconut-based products (#1.10; #1.12) Carnival for younger population of island. Local businesses and other hotels take part (#1.10;	Industrial garden shredder that slices up leaves and trimmings from plants in hotel, which are put back into nature (#1.2) Use of ceramic amenities in bathrooms (#1.2) Working with local suppliers instead of shipping everything onto island in plastic wrapping. Additionally use of reusable baskets and ice chests to limit plastic wrapping	Ceramic containers for bathroom appliances derive from a local company based on organic, coconut-based products (#1.10; #1.12) Working with local suppliers (#1.10; #1.20; #1.21)

		#1.21). Zeavola annually pledges to collect THB 80,000 to assist with equipment for the education of Chao Ley children (#1.20) Working with local suppliers (#1.10; #1.20; #1.21)	(#1.2; #1.10) Metal, plastic containers, paper, cans, glass and kitchen cooking oil are separated with fine-tooth comb and sold to recycling giants. The wet and non-recyclable garbage is incinerated (#1.2) Supporting campaign Strawless Ocean, by providing biodegradable paper straws to guests. Zeavola further offers recycled paper takeaway containers and wooden cutlery for guest's day-trips (#1.2) Water purification system (#1.2) Installation of water refill points and introduction of glass water bottles for reuse (#1.2) Waste water systems in which only clear water is permitted to enter into the next stage of filtering. Furthermore water is tested regularly for sulphur and phosphorus chemicals; and remaining mud is used as fertilizer (#1.2; #1.8; #1.16) Waste water which derives from laundry water is cleaned and pumped back into laundry for a constant cycle of reuse (#1.2). Pool water with filtration system which reduces pump run times, saving water (#1.2). Composting machine. Composted waste is used as fertilizer (#1.2; #1.8; #1.16). Green Pearls certified (#1.17)	
	https://www.greenpearls.com/hotels/zeavola/	Supporting the local school (#1.20) Assisting in renovation work for the Laem Tong school (#1.2) Supporting local government projects (#1.17) Involvement in environmental projects, supporting community by hiring locals and also supporting schools and educating kids on the environment (#1.18; #1.20; #1.21)	All-natural waste is shredded and used for garden (#1.2) Wastewater is collected from all corners of the hotel and properly disposed of and treated. Water is brought in a collection pond and used to water gardens (#1.2).	

Table 3, Results

The results (as presented in Table 3) were classified into three categories; social, economical, and environmental. For each hotel, the findings shown are firstly of the hotel's own websites, and secondly of the GPC website. The points in these sections are the practices that the hotels and certification's website publicly share. Each point has a hashtag number which corresponds to a CE indicator (the hashtag numbers can be found in Table 2).

What is prominent to observe in the results, is that the majority of the practices shared online from all hotels are within the environmental sector. Keemala for instance has less initiatives within the social and economical factor, but significantly more in the environmental domain. In terms of what is available on Keemala's website, they do openly share their practices, showing signs of transparency. From these, there are numerous points that fit under indicators of a CE. Regarding what is shared in the link of the certification, most of what is provided by Keemala is also recognizable within the certification's website, along with additional information, on other practices not shared by Keemala but that are circular. For instance, Keemala doesn't share that they employ locally, while this is mentioned on the GPC website.

The Tongsai Bai on the other hand, does not share anything regarding their approach on their website. The transparency on their practices is lacking, as they interestingly do not also display any received certifications, including the GPC. However on the GPC website, more information is available. In fact the hotel is involved in a range of initiatives, especially in the environmental sector such as recycling of garbage or used water.

Finally, out of the three hotels, Zeavola was the only hotel which dedicated a complete exhibit of their work through a book, explicitly discussing their practices, not only stating these, but explaining how and why they achieve them. It is visible that Zeavola is greatly engaged with the environmental factor. Furthermore the certification website didn't elaborate on further

practices as they kept referring to the elbarated book Zeavola has published. In sum, while one of

the three hotels does not share any of their practices, the two others did. Additionally, the

certifications website provides a range of information. Overall, the results showed circular

practices, mostly in the domain contributing to the environmental factor of circularity.

CE Indicators

When specifically looking at the content and taking into account the indicator each point

received throughout all of the hotels, it is most notable that most hotels are involved with #1.2,

which predominantly fell under the environmental dimension. #1.2, the action of "maintaining",

"reusing" and "recycling", was recognizable in numerous and distinct practices. Keemala, for

instance, has a water system in which water is reused for the garden. Other initiatives include the

recycling of waste or the utilization of recycled materials such as toilet paper, and using water

bottles instead of plastic so they can be constantly reused (and therefore maintained longer than

plastic). Indicator, #1.2, is also present in the Tongsai Bai, in which they have concrete instead of

wooden floors, so they can be maintained for a longer period of time. They also have recycling

and garbage management; continuous planting of trees; recycling water for the use of watering

plants; using leftover food as a fertilizer; and finally the use of biodegradable plastic bags and

straws. As for Zeavola, they also include a great number of practices involved with this indicator.

These include reusing the garden's shredded leaves and trimmings for nature; reusing ceramic

amenities for bathroom products; using reusable baskets and ice chests for supply shipments;

recycling systems; using biodegradable paper straws, providing paper containers and wooden

cutlery for guests; water purification system; water systems to utilize the remaining mud as

fertilizers; refill water points with glass bottles which can be constantly reused; recycling waste

water of laundry machine; maintaining pool water; and the installation of a composting machine to reuse the waste as fertilizers. Overall it is inferabled that these hotels are greatly involved with the core circular ideology of "maintain", "reuse", and "recycle".

Another indicator which occurred often is #1.10. This indicator concerns the development of deeper supply chain cooperation aiming for value co-creation within the extended local hospitality network. This was present in all three categories of a CE. For instance, the hotels were found to be successfully engaged with this indicator by supporting the local community or economy. They are engaged outside the capacities of their hotel and involved in supply chains within and beyond the extended local hospitality network. Keemala for example uses fabric or textile produced by an ethnic minority group in Thailand. Not only does this address the social dimension within a CE by supporting an ethnic group through their purchase, but also the economical dimension, using their earnings to contribute to the economy. Another example of such which Keemala is engaged in, is developing the community, infrastructure and economic-well being through local jobs or buying local products. This in fact supports all three dimensions. While Tongsai Bai, doesn't demonstrate any practices that fall under this indicator, Zeavola is involved in purchasing local products from local suppliers, and being active with other local businesses and hotels for events.

Indicator #1.20, social inclusion, which includes local employment or connections and cultural conservation, was the most recurring theme in the social dimension followed by indicator #1.21 which involves contributing to the local economy. Indicator #1.20 similar to #1.10 was present in the form of supporting local enterprises for purchasing products (such as Keemala buying fabric and textile from ethnic minority groups as mentioned before). Cultures are preserved through #1.20 as recognized in Keemala by throwing events. Another form this

indicator occurred in, is the involvement of Zeavola in environmental projects, which support

communities through hiring locally and supporting schools by also educating them on the

environment. By hiring locally, indicator #1.21 is also recognized, as this doesn't only cover

social inclusion of the local community but supplementarily contributes to the economy.

Another indicator which often occurred in the social dimension is #1.18 which embeds

the sharing of knowledge. For instance Tongsai Bai entails garbage management awareness at a

local school or shares knowledge to support local children. This is an important point as the

sharing of knowledge can be used again to contribute back to the economy (hence a circular

notion).

Finally, what was interesting to observe, is that none of the hotels branded or marketed

themselves as circular. However both Keemala and Zeavola provided information on their

website on being Green Pearls certified (#1.17). It was additionally intriguing to notice a lack of

initiatives regarding energy use (identified under #1.22), through for instance the use of

renewable energy. It would be interesting to investigate why there isn't much accomplished in

this domain.

In sum, in terms of the social aspect, the hotels were primarily involved in buying locally,

providing education opportunities (for knowledge to be used for hotels again), and employing

locally. In regards to the economical factor, hotels were mainly engaged in purchasing products

and employing locally. As for the environmental dimension, hotels had a significant range of

practices with this indicator such as incorporating waste or water systems; recycling, reusing of

certain products; or composting.

Discussion

Drawing back to the research question, *to what extent can the hospitality sector contribute to sustainable tourism through the lens of a circular economy? The case study of Thailand is* evident in the results. It can principally be recognized that the selected hotels are involved with circular practices. However the question remains if these can contribute to sustainable tourism. When discussing sustainable tourism, it was stated that it takes into account the economic, social and environmental impacts. With such, its aim is to mitigate the negative effects of tourism (United Nations Environment Programme, & World Trade Organization (WTO), 2005). These are dimensions that a CE is also engaged with, which was accordingly demonstrated in the way the data of the research was able to be collected, organized and analyzed (i.e. the social, environmental and economical). These three dimensions are of great value for both a CE and sustainable tourism (Global Sustainable Tourism Council, 2021; Sorin & Einarsson, 2020). They supplementarily translate into a useful approach when considering the hospitality sector (Jones & Wynn, 2019; Padilla-Rivera et al., 2022). For instance, the social factor ensures the involvement of local communities or generation of social capital (Sorin & Einarsson, 2020). This is further closely linked to the economical category through local employment and opportunity jobs (#1.20 and #1.21), or localized supply chains (#1.10) (Sorin & Einarsson, 2020). These are significant points which sustainable tourism also addresses by involving the local community and contributing back to the local economy (León-Gómez et al., 2021; Michniewicz-Ankierztajn et al., 2018). The results showed these through the hotels who employ and show efforts in buying their products locally. They additionally demonstrated engagement of working with the local community (through schools or business). In regards to the environment, in the realm of sustainable tourism, diminishing its negative effects tourism is

significant (Butler, 1993; Butler 1999; Hardy et al., 2002; Lu & Nepal, 2009). A CE addresses

the environmental concern by their leading goal of keeping materials within the same economy

for as long as possible, retreating from waste (#1.2) (United Nations, 2021). The regard of the

environment was visible amongst the hotels through their engagement of recycling or using

materials such as glass which can be maintained for longer. These actions reduce waste and

environmental threats such as pollution. Another consideration of the environmental factor is its

high number of indicators it received throughout the hotels. This goes in line with the literature,

as, if a CE is to green an industry (Ari & Yikmaz, 2019), embedding a number of practices which

are environmentally related is inevitable. The most approachable step based on the results

seemed to be environmental implications. These may be due to the prevalence of opportunities

the environmental sector offers (through water, waste or energy management) in comparison to

the two others. The models in the literature also predominantly offered notions which were

environmentally based, such as Figure 6, still showing economical and social opportunities

within a CE but a high number of environmental actions such as recycling, reusing and

maintaining (#1.2). High rates of #1.2 in the hospitality sector is plausible due to its

resource-based tendency as an industry (Mckercher, 1993), hence it would require more efforts

and input from the hotels. More precisely, if a resource-based industry is reliant on great amounts

of resources, a CE approach would help prevent the potential waste that may arise from such a

dependency (Mckercher, 1993; Sustainable Travel International, 2020).

In regards to the certification, hotels are forced to maintain their practices that certified

them (Blackmen & River, 2011; Long, 2020). By displaying the certification on their websites

and openly communicating these, they can be held accountable. Additionally such transparency

is significant in promoting sustainable practices (Blackmen & Rivera, 2011; Long, 2020). Out of

the three hotels, two shared their practices and exhibited the GPC. Tongsai Bai was the only hotel who did not share this, which is interesting considering that the certification acknowledges accomplishments and sustainability efforts. Zeavola on the contrary, took further measures by highlighting their commitment to sustainability through a book underlying all of their principles. Nonetheless, the GPC's website constituted a platform with transparent information sharing which showcased the sustainable initiatives of the hotels, which were, as shown in the results, recognized as circular practices.

Overall, the literature suggested that a CE is an optimal approach to gain more sustainable practice in tourism, especially within the hospitality sector. The results revealed that existing circular practices are embedded in the hotels and in the vision of sustainable tourism. Whether these are fully optimally implemented in the hotels would require more extensive research. Nevertheless the hotels, which are in the hospitality sector, demonstrated that circular practices can support sustainable tourism.

Limitations and future research

It is imperative to consider the limitations of the research. The first point is that the research was conducted from a distance and limits the findings to what is available and shared online, which can alter or be adjusted over time. Although this was the methodological choice, and provided valuable insights, it is worth noting that the information gathered has thus not been physically witnessed. Another limitation is that while the research in Thailand can provide constructive views on practices towards sustainable tourism through the lens of a CE, the results are specific to that destination, as well as the hospitality sector and may not be generalizable. Thus for future research it would be beneficial to consider other regions of Thailand, or the

world. Considering a greater sample size or range of hotels, which may also not be certified, would permit for a greater representation and comparison of the overall hospitality sector. Furthermore, the results showed a lack of circular branding of the hotels. It would consequently be interesting to research the implications of CE branding or certifications rather than only sustainability related ones. Additionally, despite the hotels existing sustainable and as found circular efforts, their communication of such are presented as rather "sustainable" than "circular". Investigating potential reasons for such or implications of the perceptions and communication of sustainability could allow opportunities for hotels to be fully circular or welcome circular certifications.

Conclusion

The paper recognized that tourism provides opportunities for positive impacts such as strengthening local economies, creating jobs or contributing to local infrastructure development. Sustaining sustainable tourism is therefore of great value, in order for these points to be enhanced, and for the negative impacts of tourism such as the degradation of the environment or threats to the local community to be mitigated. A proposed approach to achieve this, is through the use of a CE, which can provide potential prospects and opportunities for sustainable development. Furthermore, a CE can encourage a more environmentally and economically sustainable tourism industry. With regards to the hospitality sector, the use of a CE fosters practices such as waste management, energy saving plans, monitoring of energy and products life, incorporating local employment and job opportunities. Furthermore, maintaining a CE, especially if the goal includes supporting sustainable tourism practices, the involvement of a sustainability certification is beneficial. With such, practices are monitored and enterprises are enforced to abide by certain standards. The research established a sustainability certification

through the GPC in Thailand, which also served as an information tool, as they identified

practices which qualified the hotels. The results further demonstrated that the three selected

hotels are involved with practices that fall under a CE, and adhere to practices that cohere under

sustainable tourism. The paper offered insights to the research field of tourism, sustainability and

a CE. The content of sustainable tourism, the hospitality sector, and a CE were shown to be

closely interlinked, in particular, sustainable tourism and CE, who share similarities for the goal

of sustainable development. Additionally the research proposed the prospects certifications can

offer, by binding hotels to their actions and encouraging sustainable practices. Policy-makers can

therefore take into account the implications and recognition of certifications for promoting

certain standards in the tourism industry.

Overall, the research and findings can serve as an example or role model on how the negative

impacts of tourism can be reduced within the hospitality sector by implementing circular

practices, thus contributing to sustainable tourism.

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Appendix A

Categories for the proposed taxonomy of C-indicators.

Categories *(criteria)*	#1 - **Levels** *(micro, meso, macro)* #6 - **Transversality** *(generic, sector-specific)*	#2 - **Loops** *(maintain, reuse/ reman, recycle)* #7 - **Dimension** *(single, multiple)*	#3 - **Performance** *(intrinsic, impacts)* #8 - **Units** *(quantitative, qualitative)*	#4 - **Perspective** *(actual, potential)* #9 - **Format** *(e.g. web-based [tool], Excel, formulas)*	#5 - **Usages** *(e.g. improvement, benchmarking, communication)* #10 - **Sources** *(academics, companies, agencies)*

Figure 4, Categories for the proposed taxonomy of C-indicators (Saidani et al., 2019)

The first category, levels, the observed party of interest is divided into a micro, meso, or macro level. Micro includes for instance businesses, people, or items. The meso level involves a wider scope when taking into account things like symbiotic relationships and industrial parks for example. Last but not least, a city, region, province, or country would make up the macro-level. The second category shows the product's feedback loops, which primarily include maintenance and extension, reuse and remanufacturing, and recycling.

The second category depicts the feedback loops such as maintain/prolong, reuse/remanufacturing and recycling of the product.

In the third category, it is determined whether there is an intrinsic or consequential circularity present. An intrinsic circularity would for instance consider the recirculation rates of resources while a consequential circularity (the impact the performance of the circularity imposes) would regard sustainability for example. Overall, the performance indicator places emphasis on the progress of the process as well as the effect of a CE transition.

The fourth category presents a distinction between an actual or potential existing circularity. This is carried out by evaluating the CE transitions by assessing progress prior to (ex ante), during (ex durante), and following (ex post) the transition. To ascertain whether proposed CE transitions have the capacity to result in the anticipated CE impacts, an ex ante study is required. Ex durante evaluation is essential for ensuring that a CE transition process takes the

planned course and yields the expected outcomes. Ex post evaluations are executed to determine whether the outcomes of the CE transition process are consistent with the goals.

The fifth category highlights the potential use of the available C-indicators, previously discussed, to identify information recognition of actual CE's. They can be utilized more specifically for (i) informational purposes, which help understand the current state (e.g., tracking progress, benchmarking, identifying areas for improvement); (ii) decision-making purposes, which aid in taking action (managerial activities, strategy formulation, policy choice); (iii) communication (internally on the achievements to the stakeholders, externally to the public); and finally (iv) learning (education of workforce, awareness).

The transversality of C-indicators across sectors is underlined, which can be distinguished between generic and sector-specific indicators. The generic C-indicators are applicable to all industries and businesses of any size, location, field, or activity. Industry-specific C-indicators on the other hand, are more operationally oriented and tailored to certain industry purposes.

The dimensionality of C-indicators is differentiated in the seventh category. While high-dimensionality C-indicators can provide a higher level of intelligibility, which is better suited for experts, such as designers or engineers, in evaluating product circularity performance, low-dimensionality C-indicators, which reduce circularity into a single number, are helpful for managerial decision-making.

In the eighth category, information is provided on the units of the indicators. This allows for the indicators to be distinguished based on their measurability; through a quantitative or qualitative approach. This can further be utilized to determine circularity. The suggested taxonomy's sets of C-indicators cover a variety of units, such as mass, time (length of use),

intensity (emission, energy, and consumption), return on investment (savings, profit), and availability (resource use, recycling rates in percentage).

The ninth category, the format of the assessment framework in relation to the indicators to ease their calculation process (if calculated) is examined. The C-indicators have been found to be associated with computational tools, such as dynamic excel spreadsheets, web-based tools, or other softwares, as well as manual computing formulas.

In the final category, due to the diversity of actors (academic institutions, commercial enterprises or consulting firms, governmental or environmental organizations), as well as the various standards for scientific validity (such as peer review), it is necessary to identify the background and origins of the C-indicators

These indicators are valuable and essential instruments that assist with the encouragement of more circular conduct. They further help grasp an organization's structures and operations. The categories can be navigated step-by-step to identify areas where CE-related improvements might be made and recognise opportunities moving towards a CE (Saidani et al., 2019).

Appendix B

Self-developed indicators of a CE. These are the indicators which were used for the content analysis

Indicator	Reference point / abbreviation
Level (micro, meso, macro)	#1.1
Loops (maintain, reuse/remain, recycle)	#1.2
Performance (intrinsic, impacts)	#1.3
Perspective (actual, potential)	#1.4
Usages (e.g. improvement benchmarking, communication)	#1.5
Transversality (generic, sector-specific)	#1.6
Dimension (single, multiple)	#1.7
Units (quantitative, qualitative)	#1.8
Format (e.g. web-based, excel, formula)	#1.9
Develop deeper supply chain cooperation aiming for value co-creation within the extended local hospitality network	#1.10
Identify circular value creation opportunities and deployment pathways through supply chain mapping	#1.11
Consider servitization of high / mid value asset expenditures, such as bedding, furniture, F&B equipment through Product Service System agreements	#1.12
Consider the mutualisation of resources and materials (E.g. recirculation, sharing 'intra-organisations' sharing platforms, etc.)	#1.13
Focus on market positioning and marketing communications through a coherent Circular Economy hotel storytelling and brand message	#1.14

Deploy environmental impact and Circular Economy action monitoring tools to measure the resource or material productivity	#1.15
Implement Environmental Management Systems to monitor energy consumption, resource use, emissions, food waste and associated operational cost savings opportunities	#1.16
Increase cooperation with private sustainability certification organisations or government regulatory bodies	#1.17
Sharing of knowledge (regarding on the topics of sustainability, circularity or knowledge machinery)	#1.18
Use Circular Economy specialist third party expertise to provide staff understanding of CE opportunities and practices while not diverting existing labour resources	#1.19
Social inclusion (local employment for example, local connections, cultural conservation, supporting community)	#1.20
Contributing to local economy	#1.21
Use of renewable energy (solar, wind)	#1.22

Appendix C

Hotel Name	Source	CE indicators categorized by the three dimension within a CE		
		Social	Environmental	Economical
Keemala	https://www.keemala.com/green/	Use of fabric and textiles produced by ethnic minority group in Thailand (#1.10; #1.20; #1.21)	Every villa includes its own water treatment system. The quality of the treated water which is released back to the environment is in line or even exceeds the government standard (#1.2; #1.3). To ensure the quality of the treated water, it is analyzed in a laboratory monthly (#1.15; #1.16) Methane released from the waste management system is guided into the ground to diminish the 'greenhouse effect' (#1.2) Waste and rubbish is classified and treated efficiently including recycling and other methods (#1.2) Greywater is reused to water the gardens and landscape (#1.2) Provision of glass-bottled water for reduction of plastic waste (#1.2) Use of toiletries made of cloth materials and recycled paper (#1.2) A garden (named the enchanted garden) is full of naturally grown fruit, vegetables, as well as herbs which are used within Keemala's dining outlets and spa (#1.12) Green Pearls Certified (#1.17)	Use of fabric and textiles produced by ethnic minority group in Thailand supporting Thailand's economy (support macro level of the economy) (#1.10; #1.1 #1.20; #1.21; #1.21)
	https://www.greenpearls.com/hotels/keemala/	Wherever possible, vegetables and fruits are organically grown and sourced from local suppliers and farmers (#1.10) Employees receive ongoing training. Knowledge growth for effective waste management (#1.20; #1.18) Locals are employed (#1.20) Employees are specifically encouraged, supported in their development, and regularly trained (#1.20). Support and participation in local social projects such as donations, beach cleaning projects, sports day, etc. (#1.21) Showcasing Phuket's tropical woodland splendor alongside preserving Thailand's longstanding	Use of own bio-organic fertilizer produced from organic waste. This fertilizer is used for gardening (#1.2) Keemala holds different enchanted gardens with naturally and organic grown herbs, vegetables and fruits (#1.12) Employees receive ongoing training. Knowledge growth for effective waste management (#1.20) Wastewater that is already treated is reserved for watering the plantation (#1.2) Setting water conservation goals for all hotel activities and increasing internal reuse for optimizing water use, e.g., gray water is reused to water the gardens and landscape (#1.2) Rainwater is used for hydroponic plants (#1.2)	Locals are employed (#1.20) Keemala helps to develop the community, infrastructure, and economic well-being, for example through local jobs, buying local products, etc. (#1.2; #1.10; #1.20) 100% natural toiletries which are sourced locally (#1.10)

		traditions and cultures through Keemala's way of life (#1.20) Keemala helps to develop the community, infrastructure, and economic well-being, for example through local jobs, buying local products, etc. (#1.2; #1.10; #1.20)	Waste separation and recycling by providing separate containers for different types of waste (#1.2) Glass-bottled water is offered in the villas, paper straws are used instead of plastic straws, and packaging for toiletries is made from fabrics and recycled paper (#1.2) Reduced usage of natural materials, for example wood and using environmental friendly synthetic material to help preventing further deforestation and other environmental impact including transportation (#2.3) Keemala helps to develop the community, infrastructure, and economic well-being, for example through local jobs, buying local products, etc. (#1.2; #1.10; #1.20)	
The Tongsai Bai	https://www.garrya.com/en/destinations/samui			
	https://www.greenpearls.com/hotels/tongsai-bay/	Local staff is employed (#1.20) Energy saving training for locals (#1.18) Garbage Management Awareness at local school (Ban Plai Lam school) (#1.20; #1.18) Sharing knowledge, interacting and supporting local children (#1.20; #1.18) Contribution to the local community, the greater Thailand region and abroad (#1.20) Donations for building school canteen & fire station for local community (#1.20; #1.21)	Wooden floors have been replaced with concrete structure and stone tiles to avoid constant replacement of wood due to damage of sun and rain (#1.2) Implications of garbage management and recycling (#1.2) Contribution to the local community, the greater Thailand region and abroad. The Tongsai Bay is part of 'Tourism Authority of Thailand' – The 7 Green Concepts, The Green Island Foundation – Koh Samui, The Low Carbon School Project (#1.17; #1.20 #1.21) Continuous planting of trees to provide shelter and food for animals (#1.2) Use of recycled water (treated wastewater) for plantations and flushing in toilet at staff dormitory (#1.2) Used water is sent to a septic tank for purification with an effective microorganism liquid. Water is then given to the plants of the hotel (#1.2) Leftover food, leaves, and branches are sent to the organic garden to be turned into fertilizers (#1.2) Reduction of garbage by using reusable materials (#1.2) Use of biodegradable plastic bags & straws (#1.2)	Locals are employed (#1.20) Donations are collected for building school canteen & fire station for local community (#1.21)
Zeavola	https://www.zeavola.com/greenbook/	The hotel's ceramic containers for bathroom appliances (shampoo, body wash and lotion) derive from a local company based on all organic, coconut-based products with zero testing on animals	Use of industrial garden shredder that slices up leaves and trimmings from the plants in the hotel, which are then put back into nature (#1.2) Use of ceramic amenities in bathrooms for shampoo, body wash and	The hotel's ceramic containers for bathroom appliances (shampoo, body wash and lotion) derive from a local company based on all organic, coconut-based products with zero testing on animals (#1.10; #1.12; #1.21)

		(#1.10; #1.12) Zeavola throws a full-blown carnival for the younger population of the island. Local businesses and other hotels all take part to ensure a supply of educational supplies, toys and ice cream (#1.10; #1.21). Zeavola annually pledges to collect THB 80,000 to assist with equipment for the education of Chao Ley children (#1.20) Working with local suppliers (#1.10; #1.20; #1.21)	lotion (#1.2). Working with local suppliers instead of shipping everything onto the island in plastic wrapping. Additionally use of reusable baskets and ice chests to limit the plastic wrapping (#1.2; #1.10) Metal, plastic containers, paper, cans, glass and kitchen cooking oil are separated with a fine-tooth comb at source and are sold on to recycling giants on the mainland. The wet and non-recyclable garbage is sent by boat for incineration in Krabi (#1.2) Supporting campaign named Strawless Ocean, by providing biodegradable paper straws to guests. Zeavola further offers recycled paper takeaway containers as well as wooden cutlery for the guest's day-trips (#1.2) Water purification system, which involves filtering water through stones, pebbles and sand before entering wells and the sea (#1.2) Installation of water refill points which guests can refill their water bottles. Additionally the introduction of glass water bottles allows guests to reuse them (instead of single-use plastic bottles). This initiative is also known as RefillMyBottle, and can be found around the island (#1.2) Waste water systems are in place. In these only clear water is permitted to enter into the next stage of filtering. Furthermore the water is tested regularly for sulphur and phosphorus chemicals; and the remaining mud contains a very high amount of nutritious nitrogen which requires diluting before use as fertilizer for the gardens (#1.2; #1.8; #1.16. Waste water which derives from the laundry water is cleaned and pumped back into the laundry for a constant cycle of reuse (#1.2) Pool water includes a filtration system which reduces pump run times, saving water (#1.2) Composting machine named Reddonatura. Composted waste is used as nutrient rich fertilizers for gardening (#1.2; #1.8; #1.16) Green Pearls certified (#1.17)	Working with local suppliers instead of shipping everything onto the island in plastic wrapping (#1.10; #1.20; #1.21)
	https://www.greenpearls.com/hotels/zeavola/	Supporting the local school on a weekly base (#1.20) Assisting in renovation work for the Laem Tong school (#1.2) Supporting local government projects (#1.17) Zeavola is involved in environmental projects,	All-natural waste is shredded and used for garden (#1.2) The wastewater is collected from all corners of the hotel to be properly disposed of and treated. The treatment system contains 3 different stages and water is cleared of biological and chemical remains. Finally, the water is brought in a collection pond and used to water the gardens (#1.2)	

		supporting the community by hiring locals and also supporting schools and educating kids on the environment (#1.18; #1.20; #1.21)		